



## Projectiles & Flying Toys Requirements of Different Countries

	Australia/New Zealand/ Japan AS/NZS ISO 8124-1:2019/ ST2016	China GB6675.2-2014	Europe EN 71-1:2014+A1:2018	USA ASTM F963 - 17
General	<p>Projectile toys shall conform to the following requirements:</p> <ul style="list-style-type: none"> <li>- Tips or leading edges on rigid projectiles shall not protrude beyond the depth of the gauge.</li> <li>- The leading edge(s) of a projectile, as well as any corners that are adjacent to the leading edge(s), shall be smooth and free of points, burrs, flash or similar projections.</li> <li>- For rigid projectiles discharged by projectile toys with stored energy, the corners of the projectile that are adjacent to the leading edge(s) shall have rounded edges. For purposes of this requirement a radius of 0.25 mm shall be considered sufficient. (does not apply to projectiles made from paper or paperboard.)</li> <li>- Projectiles with a suction cup that pass entirely through test template C as a contact surface shall have a length <math>\geq 57</math> mm before and after testing.</li> <li>- Suction cups on projectiles with a suction cup as a contact surface shall not detach unless the detached suction cup does not pass entirely through test template C, and the exposed shaft end complies with the requirements for projections, or the suction cup is on a foam projectile where the suction cup diameter, when measured in the relaxed state, is less than or equal to the diameter of the foam shaft.</li> </ul>	<ul style="list-style-type: none"> <li>- All rigid projectiles shall have a tip radius <math>\geq 2</math> mm.</li> <li>- Helicopter rotors and single propellers in nearly vertical free flight shall have a ring around the perimeter.</li> </ul>	<ul style="list-style-type: none"> <li>- All rigid projectiles shall have a tip radius <math>\geq 2</math> mm.</li> <li>- Resilient impact surfaces shall not become detached under 60 N.</li> <li>- Helicopter rotors and single propellers in nearly vertical free flight shall have a ring around the perimeter.</li> <li>- Length of projectile with a suction cup as impact area <math>\geq 57</math> mm</li> </ul>	<ul style="list-style-type: none"> <li>- These requirements relate to certain, but not all, potential, unexpected hazards that might be caused by projectile firing toys and by the firing of improvised projectiles from such toys.</li> <li>- The toy shall conform to the requirements specified in this section after normal use testing and required abuse testing and projectile test methods.</li> </ul>

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Exemption	<ul style="list-style-type: none"> <li>- The requirements of projectiles and projectile toys with stored energy do not apply to projectiles where the maximum range of the discharged projectile <math>\leq</math> 300 mm.</li> <li>- The requirement of small part does not apply to projectile toys for children 3 years and over with a range <math>\leq</math> 100 mm., small parts that are released after testing that cannot be discharged or are unable to travel a distance greater than 100 mm when measured determination of projectile range; small parts of foam that are released from projectiles whose shafts are completely made of foam.</li> <li>- Components that function as projectiles which are permanently enclosed within a toy unless they are liberated when the outer container is tested according to reasonably foreseeable abuse tests; ground based toys propelled along a track or launched onto another surface.</li> <li>- Rotors and propellers that normally rotate in the vertical plane, e.g. a propeller on an aero plane or certain remote controlled flying toys, or rotors and propellers on projectiles that have a maximum range <math>\leq</math> 300 mm.</li> </ul>	--	<ul style="list-style-type: none"> <li>- Components that function as projectiles which are permanently enclosed within a toy unless they become accessible when the outer container is tested according to torque test, tension test, impact test, compression test, and the component is still capable of being launched;</li> <li>- Ground based toys, or components of toys, intended to be propelled along a track, gameboard, tabletop, floor or onto another surface even if they include an element of motion in free flight, for example leaps between tracks or surfaces.</li> <li>- The requirements of leading parts, Projectile toys with stored energy and certain projectile toys without stored energy do not apply to projectiles that have a maximum range <math>\leq</math> 300 mm.</li> <li>- The requirements in projectile toys without stored energy where the discharged mechanism can store energy, only when held in place by the user do not apply to projectile toys covered by bows and arrows as well as toy catapults and projectiles propelled by an elastic band.</li> </ul>	<ul style="list-style-type: none"> <li>- Ground-based toys or components of toys intended to be propelled along a track, game board, tabletop, floor or another surface even if they include an element of motion in free flight, for example leaps between tracks or surfaces, or marbles or balls launched across a game board;</li> <li>- Projectiles inaccessible to a child when they leave the discharge mechanism, for example, bagatelle or pinball games.</li> <li>- Projectiles that travel 300 mm or less.</li> <li>- For products intended for children three years of age or older the following are exempted for projectile with stored energy: <ul style="list-style-type: none"> <li>- Projectiles that travel <math>\leq</math> 100 mm.</li> <li>- Small parts that are released from a projectile following reasonably foreseeable abuse testing and that are either not capable of being launched or travel <math>\leq</math> 100 mm.</li> <li>- Small parts of foam that are released from projectiles whose shafts are completely made of foam following reasonably foreseeable abuse testing.</li> </ul> </li> </ul>

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Arrow	<ul style="list-style-type: none"> <li>- Projectiles in the form of an arrow shall have a maximum kinetic energy per unit area of contact <math>\leq 2500 \text{ J/m}^2</math>.</li> <li>- After wall impact test for projectiles, a projectile in the form of an arrow shall not produce a hazardous sharp edge or hazardous sharp point and shall continue to meet the requirements of projectile toys without stored energy.</li> <li>- Projectiles in the form of an arrow shall also:               <ul style="list-style-type: none"> <li>- be provided with a protective cap, cover or tip that is integral with the front end of the shaft, or</li> <li>- have a blunted front end to which a protective cap, cover or tip is attached, or</li> <li>- be made of a resilient material, unless it is reliant on magnetic forces.</li> </ul> </li> <li>- After torque test, tension test for protective components projectiles, in the form of an arrow with a protective cap, cover or tip shall conform to at least one of the following requirements:               <ul style="list-style-type: none"> <li>- the protective cap, cover or tip shall not become detached from the projectile, or</li> <li>- if the protective cap, cover or tip becomes detached from the projectile, the projectile shall not be capable of being discharged by the discharge mechanism, or</li> <li>- if the projectile is made of a resilient material, it shall continue to have a maximum kinetic energy per unit area of contact <math>\leq 2500 \text{ J/m}^2</math>.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Shall have a protective cover which is an integral part of the arrow</li> <li>- Shall have a blunt tip with protective cover.</li> <li>- The maximum KE of the resilient impact surface shall <math>\leq 0.16 \text{ J/cm}^2</math>, the potential danger shall be drawn to the attention of the user.</li> <li>- The impact point should <math>\geq 3 \text{ cm}^2</math>, except magnetic disc, Points of arrows shall be made of resilient material.</li> </ul>	<ul style="list-style-type: none"> <li>- fired from a bow with a kinetic energy <math>&gt; 0.08 \text{ J}</math> shall have a maximum kinetic energy per unit area of contact <math>\leq 2500 \text{ J/m}^2</math></li> <li>- shall be made of a resilient material or be provided with a protective cap, cover or tip made of a resilient material;</li> <li>- shall not produce a hazardous sharp edge or hazardous sharp point after wall impact test for projectiles, and shall continue to comply with the other requirements of projectile toys without stored energy.</li> <li>- If any of the improvised projectiles can be launched in a manner determined to be hazardous by a bow capable of firing an arrows, the toy or its packaging shall carry a warning.</li> <li>- After torque test and tension test, protective components, arrows with a protective cap, cover or tip shall conform to the following requirements:               <ul style="list-style-type: none"> <li>- the protective cap, cover or tip shall not become detached from the arrow; or</li> <li>- 2) where the protective cap cover or tip becomes detached from the arrow, the arrow shall not be capable of being launched by the bow.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- KE <math>&gt; 0.08 \text{ J}</math> shall not have a Kinetic Energy Density (KED) <math>&gt; 2500 \text{ J/m}^2</math>.</li> <li>- Projectiles in the form of an arrow shall:               <ul style="list-style-type: none"> <li>- be provided with a protective cap, cover, or tip that is integral with the front end of the shaft; or</li> <li>- have a blunt front end to which a protective cap, cover, or tip is attached; or</li> <li>- be made of resilient material; or</li> <li>- have a functional tip that relies on magnetic forces.</li> </ul> </li> <li>- After required tests, projectiles shall conform to the following requirements:               <ul style="list-style-type: none"> <li>- the protective cap, cover, or tip shall not become detached from the projectile; or</li> <li>- if the protective cap, cover, or tip becomes detached from the projectile, the projectile shall not be capable of being</li> <li>- launched by the discharge mechanism; or</li> <li>- if the projectile is made of a resilient material, it shall continue to have a maximum KED of <math>2500 \text{ J/m}^2</math>.</li> </ul> </li> </ul>

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Projectile toys with stored energy	<ul style="list-style-type: none"> <li>- Projectiles shall not, whatever their orientation, fit entirely into the small parts cylinder before and after testing in accordance with reasonably foreseeable abuse testing and wall impact test for projectiles.</li> <li>- Projectiles with a kinetic energy &gt; 0.08 J shall:               <ul style="list-style-type: none"> <li>- have a contact surface(s) made of a resilient material, and</li> <li>- be accompanied by a warning about aiming at the eyes or face, projectile toy for guidance). This requirement only applies to projectiles that might reasonably be able to be aimed at the face, and</li> <li>- have a kinetic energy per unit area <math>\leq 2500 \text{ J/m}^2</math>.</li> </ul> </li> <li>- Where a protective cap, cover or tip is used it shall either:               <ul style="list-style-type: none"> <li>- not become detached from the projectile during torque test and tension test for protective components, or</li> <li>- if the protective cap, cover or tip becomes detached and if any resulting component can still be discharged from the discharge mechanism, the toy shall continue to comply with the requirements of projectile toys with stored energy.</li> </ul> </li> <li>- During wall impact test for projectiles, projectiles shall not produce a hazardous sharp edge or a hazardous sharp point and shall continue to meet the requirements projectile toys with stored energy.</li> </ul>	<p>If KE &gt; 0.08 J:</p> <ul style="list-style-type: none"> <li>- Shall have a leading part(s) made of a resilient material so that the <math>\text{KED} \leq 0.16 \text{ J/cm}^2</math></li> <li>- the protective cap, cover or tip:               <ul style="list-style-type: none"> <li>a) shall not become detached from the projectile after torque test and tension test, or</li> <li>b) any detached component(s) shall not be capable of being discharged by the discharge mechanism</li> </ul> </li> <li>- be accompanied by a warning about the potential hazard of aiming at the eyes or face</li> <li>- After test for projectiles, projectiles shall not produce a hazardous sharp edge or a hazardous sharp point</li> <li>- The discharge mechanism shall be designed so that it is unable to launch the improvised projectiles</li> <li>- Shall not contain small part</li> <li>- Small part after abuse test shall not be unable to launch from the discharge mechanism</li> </ul>	<ul style="list-style-type: none"> <li>- Kinetic energy &gt; 0.08 J shall:               <ul style="list-style-type: none"> <li>a) have a leading part(s) made of a resilient material.</li> <li>b) be accompanied by a warning about the potential hazard of aiming at the eyes or face.</li> <li>c) have a kinetic energy per unit area not greater than <math>2500 \text{ J/m}^2</math></li> </ul> </li> <li>- Edges on projectiles discharged from a projectile toy with stored energy that are adjacent to the leading part(s), shall be visibly rounded.</li> <li>- Projectiles with a resilient leading part that is a protective cap, cover or tip, covering a rigid shaft or other rigid part, shall meet one of the following conditions:               <ul style="list-style-type: none"> <li>a) the protective cap, cover or tip shall not become detached from the projectile after torque test and tension test, or</li> <li>b) any detached component(s) shall not be capable of being discharged by the discharge mechanism further than 300 mm, or</li> <li>c) any detached component(s) shall continue to comply with 4.17</li> </ul> </li> <li>- After wall impact test for projectiles, projectiles shall not produce a hazardous sharp edge or a hazardous sharp point and shall continue to comply with 4.17.3</li> <li>- The discharge mechanism shall be designed so that it is unable to launch the improvised projectiles</li> </ul>	<ul style="list-style-type: none"> <li>- Shall not fit entirely into the small parts in any orientation,</li> <li>- Any projectile that has a kinetic energy &gt; 0.08 J shall have resilient leading edge(s).</li> <li>- Projectiles that have a kinetic energy &gt; 0.08 J shall not have a Kinetic Energy Density (KED) &gt; <math>2500 \text{ J/m}^2</math>.</li> <li>- The resilient leading edge(s) on projectiles that have a kinetic energy &gt; 0.08 J shall either:               <ul style="list-style-type: none"> <li>- Not become detached from the projectile; or</li> <li>- If the resilient leading edge(s) becomes detached from the projectile, each separated part the projectile which can still be launched by the discharge mechanism shall continue to meet the requirements.</li> </ul> </li> <li>- Projectiles shall not have any sharp edges or sharp points before and after testing and the projectile shall continue to comply with the applicable requirements of this standard.</li> </ul>



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Projectile toys without stored energy	<ul style="list-style-type: none"> <li>-Projectile toys without stored energy that might reasonably be able to be launched at the face, should be accompanied by instructions for use, which draw attention to the hazards of aiming at eyes or face.</li> <li>-This requirement does not apply to projectile toys intended to be thrown towards people, e.g. flying discs, balls and similar objects.</li> <li>-Mouth-actuated projectile toys shall not permit the intended projectile to pass through the mouthpiece.</li> <li>-Projectiles in the form of a dart shall conform to the following requirements:               <ul style="list-style-type: none"> <li>a) contact area of the dart shall be <math>\geq 3 \text{ cm}^2</math>.</li> <li>b) The dart shall either:                   <ul style="list-style-type: none"> <li>-be provided with a protective cap, cover or tip that is integral with the front end of the shaft, or</li> <li>-have a blunted front end to which a protective cap, cover or tip is attached, or</li> <li>-be made of a resilient material, unless it is reliant on magnetic forces.</li> </ul> </li> <li>c) After torque test and tension test for protective components, projectiles in the form of a dart with a protective cap, cover or tip shall conform with at least one of the following requirements:                   <ul style="list-style-type: none"> <li>- the protective cap, cover or tip shall not become detached from the projectile, or</li> <li>- if the protective cap, cover or tip becomes detached from the projectile, the projectile shall not be capable of being discharged by the discharge mechanism, or</li> <li>- if the protective cap, cover or tip becomes detached from the projectile and the projectile is made of a resilient material, it shall continue to have a contact area of <math>\geq 3 \text{ cm}^2</math>.</li> </ul> </li> </ul> </li> </ul>	<p>Darts shall be blunted or points protected by a resilient material having an impact area <math>\geq 3 \text{ cm}^2</math>. Points shall not be made of metal; except that if fitted with magnetic metal discs, the disc has an area <math>\geq 3 \text{ cm}^2</math>.</p>	<p>Darts shall:</p> <ol style="list-style-type: none"> <li>1) have resilient leading parts, or</li> <li>2) be provided with a protective cap, cover or tip made of a resilient material, or</li> <li>3) have a leading part with a contact surface area of <math>\geq 2 \text{ cm}^2</math></li> </ol> <p>After torque and tension test:</p> <ol style="list-style-type: none"> <li>1) the protective cap, cover or tip shall not become detached from the dart; or</li> <li>2) if there is a discharge mechanism, where the protective cap cover or tip becomes detached from the dart, the dart shall not be capable of being launched by the discharge mechanism.</li> </ol> <p>Toy catapults and projectiles propelled by an elastic band</p> <p>Projectiles launched by:</p> <ol style="list-style-type: none"> <li>a) toy catapults with projectiles, or</li> <li>b) an elastic band that is capable of holding a projectile shall meet the relevant requirements of 4.17.3.</li> </ol>	<ul style="list-style-type: none"> <li>- Mouth-actuated discharge mechanisms shall include a permanently-installed means to prevent passage of the projectile backwards through the mouth end of the launcher. This mechanism shall not be user-removable and shall not detach during testing. If such means to prevent passage of the projectile is integral with the mouthpiece, the mouthpiece shall not be user-removable, and shall not detach during testing. If the toy includes user-removable mouthpieces or projectiles of different designs, or both, each design or combination, or both, shall be tested separately.</li> <li>- Mouthpieces intended to be user-removable shall not fit entirely within the small parts test cylinder. If a permanently-attached mouthpiece detaches from the discharge mechanism, it shall not fit entirely within the small parts test cylinder.</li> <li>- Projectiles shall not have any sharp edges or sharp points before and after testing and the projectile shall continue to comply with the applicable requirements of the standard.</li> </ul>

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Projectile toys without stored energy (Cont'd)			<p>If any of the improvised projectiles can be launched in a manner determined to be hazardous by a toy catapult with projectiles or by an elastic band that is capable of holding a projectile, the toy or its packaging shall carry a warning.</p> <p>Projectile toys without stored energy where the discharge mechanism can store energy, only when held in place by the user</p> <ul style="list-style-type: none"> <li>- Projectiles launched by a discharge mechanism where the discharge mechanism can store energy only when held in place by the user, shall meet the relevant requirements of 4.17.3.</li> </ul>	



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Rotors	<ul style="list-style-type: none"> <li>- Rotors and propellers powered by electrical, spring or inertial energy and that take off into free flight shall be designed to minimize the potential of rotating blades to cause injury.</li> <li>- For example, this may be accomplished by one or more of the following:               <ul style="list-style-type: none"> <li>- the design of the rotor or propeller shall prevent access to the blade ends during operation;</li> <li>- the blade ends shall be “clutched” or loosely attached to the rotor so that the ends are not directly powered by the rotor drive;</li> <li>- rotors or propellers shall be designed so that the leading edges are protected with a resilient material</li> </ul> </li> </ul>	--	<ul style="list-style-type: none"> <li>- Leading part(s) on rigid parts of flying toys shall not protrude beyond the depth of the gauge</li> <li>- Rotors and propellers on flying toys shall be designed to minimize the potential of rotating blades causing eye injury. This may be accomplished for example by one or more of the following:               <ol style="list-style-type: none"> <li>a) the design of the toy prevents the blade ends contacting the eyes (e.g. a protective ring around the perimeter of the rotor or propeller or by enclosing the rotor or propeller in a cage);</li> <li>b) the blades are made of flexible material that does not break or permanently deform when tested according to perpendicular tension test for rotors and propellers;</li> <li>c) the blade ends are “clutched” or loosely coupled to the rotor so that the ends are not directly powered by the rotor drive;</li> <li>d) a partial ring around the perimeter of the rotor or propeller;</li> <li>e) rotors or propellers are designed so that the leading part(s) are protected with a resilient material or flexible part.</li> </ol> </li> </ul> <p>Flying toys with rotors or propellers that might reasonably be able to be aimed at the face shall be accompanied by a warning about the potential hazard of rotors or propellers impacting the eyes or face. (This warning is not required where the design of the toy prevents the blade ends contacting the eyes (case a) above).)</p>	<ul style="list-style-type: none"> <li>- Rotors on projectiles intended to rotate in a horizontal plane shall be protected.</li> <li>- Some examples of how this can be accomplished include the following:               <ul style="list-style-type: none"> <li>- the design of the rotor or propeller prevents access to the blade ends during operation,</li> <li>- the rotor blades are curved or swept back,</li> <li>- the blade ends are “clutched” or loosely attached to the rotor so that the ends are not directly powered by the rotor drive,</li> <li>- rotors or propellers are designed to have resilient leading edges.</li> </ul> </li> <li>- Depending upon the rotor design selected, one or more of the design options may be required.</li> </ul>